EX PARTE OR LATE FILED

YOUNG & JATLOW
2300 N STREET, N. W.
SUITE 600
WASHINGTON, D. C. 20037

DAVID C. JATLOW
FRANCIS L. YOUNG*
*ADMITTED IN TEXAS

TELEPHONE
(202) 663-9080
TELEFAX
(202) 331-8001

April 6, 1998

Ms. Magalie Roman Salas, Secretary
Federal Communications Commission
1919 M Street, N.W.
Washington, D.C. 20554

In re: **Ex Parte Communication**
Ericsson Inc.
CC Docket 94-102

Dear Ms. Salas:

Attached hereto, in duplicate, is a copy of a written presentation in the above-reference proceeding which Ericsson submitted on this date to the Chief of the Wireless Telecommunications Bureau.

Pursuant to the provisions of Section 1.1206 of the Commission's rules, Ericsson requests that these copies be included in the record of this proceeding.

Respectfully submitted,

David C. Jatlow
Counsel for Ericsson Inc.

cc: Mr. Daniel Phythyon
Mr. John Cimko
Mr. Ron Netro
Ms. Won Kim

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April 6, 1998

Mr. Daniel Phythyon, Chief
Wireless Telecommunications Bureau
Federal Communications Commission
2025 M Street, N.W.
Washington, D.C. 20554

In re: Written Ex Parte Presentation
CC Docket No. 94-102
Ericsson Inc.

Dear Mr. Phythyon:

On behalf of Ericsson Inc. ("Ericsson") and pursuant to Section 1.1206 of the Commission's rules, the following is a written ex parte presentation, being submitted for inclusion in the record of the above-described proceeding.

Subsequent to the release of the *Memorandum Opinion and Order* in CC Docket No. 94-102[1] (hereinafter referred to as "Memorandum Opinion and Order"), petitions for reconsideration and requests for clarification were filed regarding certain wireless E911 implementation issues. In the Memorandum Opinion & Order the Commission slightly revised the text of Section 20.18(e) relative to the accuracy requirement for ALI using Root Mean Square ("RMS") methodology. If the Commission does not re-evaluate its clarification, covered carriers may be unable to comply with Section 20.18(e) by October 1, 2001. Ericsson asserts that the Commission should clarify that in order for covered carriers to provide to the designated PSAP the location of all 911 calls by longitude and latitude with an accuracy of 125 meters using RMS methodology, it is sufficient to attempt to locate all calls and succeed in locating wireless 911 calls with an accuracy of 125 meters RMS error in 90% of the cases.

[1] In the Matter of Revision of the Commission's Rules to Ensure Compatibility with Enhanced 911 Emergency Calling Systems, CC Docket No. 94-102, *Memorandum Opinion and Order*, __ FCC Rcd __ (released December 23, 1997).

In the *Report and Order and Further Notice of Proposed Rulemaking*[2] (hereinafter "First Report and Order"), the Commission required "covered carriers" to provide Automatic Number Information ("ANI") and Automatic Location Identification ("ALI") for mobile units accessing carriers' wireless systems. The Phase I rules, among other things and under certain conditions, require licensees subject to the wireless E911 rules to provide the telephone number of the mobile unit as well as the cell site location or sector within which the mobile unit is located.[3] The Phase II rules, which are currently due to become effective no later than October 1, 2001, require covered carriers to provide the location of a mobile unit by latitude and longitude within a radius of 125 meters using RMS methodologies.

Until the Commission released its Memorandum Opinion and Order in December, 1997, the wireless industry relied on statements made in the text of the 1996 First Report and Order on how to determine the 125 meter RMS accuracy standard:

> ....we adopt a requirement pursuant to which covered carriers must achieve the capability to identify the latitude and longitude of a mobile unit making a 911 call, within a radius of no more than 125 meters in 67 percent of all cases. The degree of accuracy will be calculated through use of Root Mean Square methodology. For purposes of complying with the requirement, covered carriers shall attempt to invoke the equipment and facilities they have deployed to determine mobile unit location in each case in which a 911 call transits their system. For purposes of applying the RMS methodology, the level of accuracy achieved by the carrier shall be calculated based upon all 911 calls originated in a service area in which the carrier is required to supply Automatic Location Identification to PSAPs.[4]

> ....the rule will require cellular, broadband PCS, and geographic area SMR licensees to upgrade their equipment so that: Emergency service providers will be sent the location of the 911 caller within a radius of 125 meters by longitude and latitude in 67 percent of all cases.[5]

Relying on the plain meaning of the foregoing language, numerous hours of engineering time has been devoted to developing ALI solutions based on the assumption

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[2] In the Matter of Revision of the Commission's Rules to Ensure Compatibility with Enhanced 911 Emergency Calling Systems, CC Docket No. 94-102. *Report and Order and Further Notice of Proposed Rulemaking*, 11 FCC Rcd 18676 (1996).

[3] As will be discussed below, Phase I wireless E911 rules require covered carriers to provide some information regarding the location of a wireless device

[4] Id, para 71.

[5] Id., Appendix III.

that carriers must achieve the capability to identify the latitude and longitude of a mobile unit making a 911 call within a radius of no more than 125 meters in 67% of all cases.

The Commission revised its interpretation of the ALI accuracy requirement in the Memorandum Opinion and Order based on concerns expressed by the I-95 Coalition that some parties would interpret the language of the text to allow wireless carriers to attempt to locate only 67% of wireless 911 calls and of those calls the 125 meter RMS standard had to be applied. As a result, in the Memorandum Opinion and Order the FCC clarified its original interpretation of Section 20.18(e) and stated:

> To the extent that the discussion in the E911 First Report and Order may be unclear, we clarify that, as of October 1, 2001, licensees subject to this section must provide to the designated PSAP the location of all 911 calls by longitude and latitude such that the RMS is 125 meters or less, which would represent approximately 67 percent to 75% probability that the reported location would be within a 125 meter radius of the caller's actual location. This would include 911 calls made by roamers in a carrier's service area.[6]

In fact, the wireless location industry had been working on the assumption that it would only be required to locate a wireless caller within 125 meters 67% of the time. Indeed, in comments, pleadings and/or ex parte presentations made on this issue, various parties, including Motorola and TruePosition expressed the view that the accuracy requirement of 125 meters 67% of the time was achievable. Similarly, in the CTIA E911 Workshop on Location Technology, TIA's TR 45.2 Wireless Emergency Services Task Group submitted a contribution which clearly stated that the Phase II requirements must "...provide initial latitude and longitude of a caller within 125 m RMS (67% of the time)."

The Commission's original interpretation of the ALI accuracy standard (location within 125 meters in 67% of the cases/calls) is considerably different than the clarification in the Memorandum Opinion and Order. Ericsson is concerned that carriers will not be able to meet the goal of locating wireless E911 calls with an accuracy level of 125 meters using RMS methodologies. This is due to the fact that while carriers can attempt to "locate" all wireless E911 calls, not all calls will be located within 125 meters. In fact, as described below, due to a variety of factors, a small percentage of wireless E911 calls are likely to be located within several hundred meters as opposed to 125 meters. When RMS methodologies are used to determine the overall level of ALI accuracy, it can be mathematically proven[7] that location of only a few wireless E911 calls with large errors (i.e., the difference between the reported position and the actual position of the wireless unit) will render it impossible for a wireless carrier to meet the 125 meter requirement on an overall basis.

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[6] MO&O, para 125.

[7] See, Ex Parte presentation of Ericsson Inc. to the Wireless Telecommunications Bureau, CC Docket No. 94-102, March 20, 1998 which describes the mathematical premise upon which this statement is made.

For example, in a GPS solution to Phase II location of wireless calls, a wireless customer making a call in an indoor environment may get sufficient terrestrial coverage to obtain service, but may not be able to receive sufficient signal from the GPS satellite constellation to provide precise location information. Similarly, in time-based or angle-based location methods of Phase II location of wireless calls, a wireless customer may have sufficient RF coverage to make a call but insufficient coverage from a sufficient number of base stations to obtain precise location information. In fact, the best case situation a wireless carrier can hope for in these situations is that the location of the wireless unit can be provided in accordance with the existing Phase I requirements, i.e., location by cell site or cell sector. Except in cases where a wireless unit is located in the very smallest of cells, the location that can be expected under Phase I requirements is in the order of several hundred meters as opposed to the Phase II requirement of 125 meters. While the situations described above may only occur for a small percentage of E911 wireless calls placed, the small fraction of calls in which there are very large location errors will distort the RMS value. Calculating the RMS error using the formula defined below will result in the inability of covered carriers to meet the ALI accuracy level specified in Section 20.18(e), i.e., "...location of all calls within 125 meters using RMS methodologies."

To ensure that location companies and covered carriers have a Phase II legal requirement that they can strive to meet, the Commission should issue a further clarification on its Phase II ALI accuracy requirement that takes into consideration the fact that some wireless E911 calls will not be able to be located with sufficient precision so the overall RMS error is below 125 meters. Ericsson asserts that the FCC should make the following clarification:

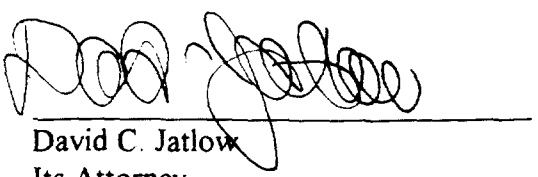
> Covered carriers should have the ability to locate all calls requested by the PSAP with the expectation that in 90% of all calls placed, covered carriers shall meet an accuracy of 125 meters RMS error with RMS error defined as follows:
>
> $$RMS\ error = \sqrt{\frac{\sum_{i=1}^{N}\left[(x_i - x_i')^2 + (y_i - y_i')^2\right]}{N}}$$
>
> Where *(xi, yi)* is the true 2-dimensional position for call i; *(xi', yi')* is the estimated 2-dimensional position for call i; and N is the total number of calls on which the RMS error is based.

The foregoing clarification would be beneficial for three reasons. First, it ensures that the 125 meter RMS accuracy level is likely to be met. Second, by using the values for the best 90% of wireless E911 calls placed, it takes into account the fact that up to 10% of wireless E911 calls will not be able to be located within 125 meters. Due to factors related to wireless system design and the limitations of virtually all existing location technologies, some wireless E911 calls will only be able to be located with an accuracy

level measured in several hundreds of meters. Third, and most importantly, it takes into account the fact that the application of RMS statistical methods to calls which can not be located with precision, do not result in a covered carrier's failure to comply with the Section 20.18(e) ALI accuracy requirement.

Very truly yours,

Ericsson Inc.



David C. Jatlow
Its Attorney

cc: Mr. John Cimko
Mr. Ron Netro
Ms. Won Kim